

Application No. 10/626,273
Amendment dated November 17, 2006
Reply to Office Action of August 22, 2006

REMARKS

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of August 22, 2006. Amendments to selected claims are tendered above.

Reconsideration of the application as amended is requested.

The Office Action

Claims 1, 7, 21, 24-28, and 30-31 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication 2004/0117397 by Rappold III (hereinafter Rappold).

Claims 2 and 3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 1, and further in view of U.S. Patent No. 6,643,652 issued to Helgeson et al. (hereinafter Helgeson).

Claim 4 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold in view of Helgeson as applied to claim 2, and further in view of U.S. Patent No. 6,782,383 issued to Subramaniam et al. (hereinafter Subramaniam).

Claim 5 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold in view of Helgeson, and in view of Subramaniam as applied to claim 4, and further in view of U.S. Patent No. 6,934,696 issued to Williams et al. (hereinafter Williams).

Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold in view of Helgeson as applied to claim 2, and further in view of Williams.

Claim 8 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 7, and further in view of U.S. Patent No. 6,611,838 issued to Ignat et al. (hereinafter Ignat).

Claims 9, 11, and 12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 1, and further in view of U.S. Patent No. 5,717,925 issued to Harper et al. (hereinafter Harper).

Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold in view of Harper as applied to claim 9, and further in view of U.S. Patent No. 5,710,915 issued to McElhiney.

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Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 1, and further in view of U.S. Patent No. 6,629,091 issued to Miura et al. (hereinafter Miura).

Claim 14 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 1, and further in view of U.S. Patent No. 6,014,677 issued to Hayashi et al. (hereinafter Hayashi).

Claim 15 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 1, and further in view of Williams.

Claim 16 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 1, and further in view of U.S. Patent No. 6,041,325 issued to Shah et al. (hereinafter (Shah)).

Claim 17 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold in view of Shah as applied to claim 16, and further in view of Subramaniam.

Claims 18-19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 1, and further in view of U.S. Patent Application Publication 2004/0199495 by Colbath et al. (hereinafter Colbath).

Claim 20 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 1, and further in view of U.S. Patent Application Publication 2004/0139070 by Dysart et al. (hereinafter Dysart).

Claim 22 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 21, and further in view of Williams.

Claim 23 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold in view of Williams as applied to claim 22, and further in view of Subramaniam.

Claim 29 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 28, and further in view of Miura.

Claim 32 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 31, and further in view of Subramaniam in view of Helgeson, in view of Williams, and in view of U.S. Patent Application Publication 2002/0174196 by Donohoe et al. (hereinafter Donohoe).

Claim 33 stands rejected under 35 U.S.C. §103(a) as being unpatentable over

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Rappold as applied to claim 21, and further in view of Subramaniam in view of Helgeson, in view of Williams, and in view of Donohoe.

Claim 34 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Rappold as applied to claim 27, and further in view of Subramaniam in view of Helgeson, in view of Williams, and in view of Donohoe.

The Art Rejections

Independent Claims 1, 21 and 27 are in Condition for Allowance

Independent claim 1 has been amended to clarify the claimed embodiments of the invention and recites an abstraction layer for a database containing database records. Each record includes fields stored in one or more tables, the fields being associated with the record by a key disposed in at least one key column of each table. Claim 1, as amended, recites an abstraction layer wherein "the abstraction layer is separate from the database, and the abstraction layer provides an interface to the database independent of an underlying model and functionality of the database thereby providing extensible functionality for the database separate from the underlying model and functionality of the database" (underlining added for emphasis). The Examiner has rejected the claim as being anticipated by Rappold, asserting that Rappold discloses a key column identifier (Figure 1, elements 110 and 112) that identifies the at least one key column. The Examiner further asserts that the abstraction layer of Rappold provides a database interface substantially independent of an underlying model of the database thereby providing extensible functionality for the database. Applicants respectfully traverse the Examiner's rejection of independent claim 1 for at least the reasons set forth below.

First, with reference to the key column identifier of Rappold (elements 110 and 112 in Figure 1), Rappold describes elements 110 and 112 as follows:

Column 110 holds numbers identifying the individual row 100, similar to a typical relational database. In this example, those numbers run from "121" to "127". Column 112 holds entity IDs identifying the individual who has an attribute stored on that row 100. Here, those entity IDs are either "81" for Alice B. Jones or "92" for Frank Smith. Each row 100 holding an attribute for either of these entities has that entity's particular entity ID in this column. This links the particular attribute stored on that row to the particular logical entity it describes.

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In other words, column 110 is simply a pointer to the row, much like a page pointer is a pointer to a physical record in a database. Column 112, however, which holds the entity IDs, corresponds more closely to the key column recited in the preamble of pending claim 1. These columns, in both Rappold and in the preamble of claim 1, contain the identifying data (ID/key) for a particular row in the database (see also Rappold, paragraph 24).

It is to be further noted that the metadata table 11 of Rappold (Figure 1) does not include a key column identifier or key column identifier table. That is to say, there is nothing in the metadata table that identifies or points to the entity ID column 112 of the database. Nor is there an identifier or pointer to column 110 which holds the row identifying numbers. The metadata table 11 is simply a table having rows 101, each of which "provides parameters and formatting information for one attribute type stored in data table 10. Column 111 holds numbers representing the attribute type whose parameters and formatting information is provided on that particular row 101 of metadata table 11. These correspond to the entries in column 114 of data table 10, as illustrated by the connections between entry 111a in metadata table 11 and entries 114a and 114e in data table 10" (Rappold, paragraph 29). Essentially, the metadata table 11 of Rappold essentially provides a lookup table definition of each of the attribute IDs 114 and associated data 116 in the database 10.

One aspect of independent claim 1, however, is the recitation, as amended, of "a key column identifier table that identifies the at least one key column." It is this key column identifier table that enables the abstraction layer of claim 1 to associate the rows or records of the database tables with corresponding database records. The unique key column of the database tables is identified by the key column identifier table (page 8, lines 5-10). Without this key column identifier table or an equivalent thereof, the abstraction layer would obviously be unable to access database records without having programmed-in knowledge of the database, or other means of identifying the key columns of the database. Rappold neither teaches nor suggests this distinguishing feature recited in claim 1, as amended.

Second, with reference to the separate extensible functionality, as indicated above, the abstraction layer recited in claim 1 provides an interface to the database independent of an underlying model and functionality of the database. This feature thus provides

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extensible functionality for the database separate from the underlying model and functionality of the database. Unlike Rapport which requires some connection to the database including apriori knowledge of the database 10 in order to access the database, no part of the abstraction layer recited in claim 1 is embedded or provided in the database itself. The abstraction layer 50 as shown in Figure 1 and associated description and as recited in claim 1 is clearly isolated and separate from the database 10 for which extensible functionality is being provided. The abstraction layer provides the necessary information to the user application for accessing the database, in part, by means of the above-described key column table 54 which identifies the key/ID columns of the database 10. The user application does not need any apriori knowledge of the database in order to successfully access the database.

It is worthy of note also that the controls table recited in claim 1 as amended enables extending the functionality of the database by modification of the controls table (page 18, lines 6-8; and page 21, line 21 – page 22, line4). No modification of the database is necessary to provide the extended functionality. Contrariwise, the extensible functionality disclosed by Rappold is intimately interwoven between the database and the metadata table as shown in Figure 1. After all, Rappold is directed to an extensible database system (paragraph 1) rather than to a metadata system or abstraction layer which provides the extensibility. For example, to add a new attribute type, although no DDL is needed, both the metadata table 41, and the database 50 require use of the new attribute type (paragraphs 40-43).

In fact, the extensible functionality taught by Rappold is directly linked to the particular database design disclosed by Rappold. The particular feature addressed by Rappold is that the database is extensible without requiring the use of a DDL (paragraph 6). Although Rappold discloses that any type of existing relational database system can be used, the database itself obviously has to include the above-described attribute type relationship, thereby teaching against abstraction of the database where no such relationship is required (paragraph 7 and claim 1). On the other hand, the abstraction layer as recited in amended claim 1, teaches extensible functionality for the database separate from the underlying model and functionality of the database.

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It is respectfully submitted, therefore, that the Rappold patent application does not teach each and every element of claim 1 in that it does not teach a key column identifier table in the abstraction layer as recited in claim 1 of the instant application, as amended. Nor does Rappold teach the provision of extensible functionality for the database in the abstraction layer that is separate from the database itself. For at least the above reasons, it is respectfully submitted that independent claim 1 is patentably distinct over the art of record.

Independent claims 21 and 27 were rejected for reasons similar to independent claim 1. Each of independent claims 21 and 27 has been amended herein to clarify the claimed embodiments of the invention and to recite limitations similar to the above-mentioned limitations of independent claim 1, as amended. For at least this reason, it is also respectfully submitted that independent claims 21 and 27 are patentably distinct over the art of record.

Dependent Claims 2-20 and 31-32 are in Condition for Allowance

It is respectfully submitted that claims 2-20 and 31-32, being dependent from amended claim 1, are also patentably distinct over the art of record.

Dependent Claims 22-26 and 33 are in Condition for Allowance

It is respectfully submitted that claims 22-26 and 33, being dependent from amended claim 21, are also patentably distinct over the art of record.

However, with reference to claims 24 and 25, the Examiner made reference to columns 110/210, 112, 114 of Rappold as being included in an abstraction layer. Applicants respectfully point out the above-identified columns are part of the database 10/20 rather than a metadata table or abstraction layer. The abstraction layer as recited in independent claim 21 from which claims 24-25 depend, is clearly recited in claim 21, as amended, as being separate from the database.

Dependent Claims 28-30 and 34 are in Condition for Allowance

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It is respectfully submitted that claims 28-30 and 34, being dependent from amended claim 27, are also patentably distinct over the art of record.

However, with reference to claim 31, the Examiner made reference to columns 110 and 114 of Rappold as being included in an abstraction layer. Applicants respectfully point out the above-identified columns are part of the database 10 rather than a metadata table or abstraction layer. The abstraction layer as recited in independent claim 27 from which claim 31 depends, is clearly recited in claim 27, as amended, as being separate from the database.

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CONCLUSION

In view of the above amendments, comments, and arguments presented, it is respectfully submitted that all pending claims (claims 1-34) are patentably distinct and unobvious over the references of record.

Allowance of all pending claims and early notice to that effect is respectfully requested.

Respectfully submitted,

FAY, SHARPE, FAGAN,
MINNICH & MCKEE, LLP

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Date

Michael E. Hudzinski

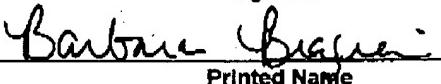
Reg. No. 34,185
1100 Superior Avenue, 7th Floor
Cleveland, Ohio 44114-2579
(216) 861-5582

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